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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,048	10/29/2003	Vladimir Grushin	PE0649USDIV6	5833

23906 7590 12/08/2005

E I DU PONT DE NEMOURS AND COMPANY
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EXAMINER	
SMOOT, STEPHEN W	

ART UNIT	PAPER NUMBER
2813	

DATE MAILED: 12/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/696,048	GRUSHIN ET AL.	
	Examiner	Art Unit	
	Stephen W. Smoot	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office action is in response to applicant's amendment filed on 16 August 2005.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamprecht et al. (US 6,169,184 B1) in view of Forrest et al. (US 6,894,307 B2) and the article by Djurovich et al. in Polymer Preprints (vol. 41, 2000, pp. 770-771 – from applicant's IDS).

Hamprecht et al. disclose the compound as claimed in claim 16, namely, 5-methyl-2-(2,4-difluorophenyl)pyridine (See col. 1, lines 5-27). In formula I of Hamprecht et al., R4 can be an alkyl (e.g. methyl), R3 and R5 can be hydrogen, and R1 and R2 can be fluorine.

However, Hamprecht et al. do not teach or suggest that this compound can be used as a precursor for an iridium compound used as an organic layer in an electronic device, which is a limitation of claim 16. More specifically, Hamprecht et al. do not teach or suggest that the organic layer can be a light emitting layer (the limitation of claim 17), nor do they teach or suggest that the organic layer can be a charge transport layer (the limitation of claim 18).

Djurovich et al. teach an organic LED (see Introduction, first paragraph) with iridium complexes that include difluorophenylpyridine ligands. However, regarding claim 16, Djurovich et al. lack the as-claimed methyl group and, further, do not expressly teach or suggest that the fluorine substituents be located in the R1 and R2 positions, as taught by Hamprecht et al. Forrest et al., like Djurovich et al., disclose substituted phenylpyridine ligands for iridium complexes, and further teach that the substituents can include alkyls (e.g. methyl) and, further, that the substituents can be located in any position on either ring of the phenylpyridine ligand (see column 17, line 44 to column 18, line 27). Also, regarding claim 18, Forrest et al. teach that the emissive layer can include a hole transporting matrix (see column 10, line 64 to column 11, line 17).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Hamprecht et al., Forrest et al., and Djurovich et al. in order to use formula I of Hamprecht et al. as a precursor for iridium complexes used in organic light emitting layers as taught by Forrest et al. and Djurovich et al. Forrest et al. recognize that the inclusion of an alkyl substituent (e.g.

methyl) is within the skill level of the art to obtain desired emissive properties (see column 17, line 44 to column 18, line 27) and Djurovich et al. recognize that solubility in organic solvents is improved with the addition of the fluorine substituents (see paragraph bridging pp. 770-771).

3. Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamprecht et al. (US 6,169,184 B1), Forrest et al. (US 6,894,307 B2), and the article by Djurovich et al. in Polymer Preprints (vol. 41, 2000, pp. 770-771 – from applicant's IDS) as applied to claims 16-18 above, and further in view of the communication by Dedeian et al. in Inorganic Chemistry (vol. 30, 1991, pp. 1685-1687 – from applicant's IDS).

As shown above, the combination of Hamprecht et al., Forrest et al., and Djurovich et al. have all of the limitations set forth in claims 16-18 of the applicant's invention. Also, this combination covers the further limitations to claim 12 as set forth in claims 13-15. However, this combination lacks the compound with the structures as set forth in claim 12. Referring to Table I, Dedeian et al. disclose fluoro- and trifluoromethyl-substituted 2-phenylpyridines as light-emitting materials, as shown in the upper, right-hand corner of p. 1686.

Regarding any of the as-claimed structures in claim 12 with two fluorines, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to locate the alkyl (e.g. methyl) and fluorine substituents of Hamprecht et al. in any position on either ring of the phenylpyridine ligand, as suggested by Forrest et al., to thereby obtain desired emissive properties. Forrest et al. recognize that such a

modification is within the skill level of the art (see column 17, line 44 to column 18, line 27).

Regarding any of the as-claimed structures in claim 12 with either one fluorine or one trifluoromethyl, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the structure of Hamprecht et al. to include just one fluorine or just one trifluormethyl, as taught by Dedeian et al., in any position on either ring of the phenylpyridine ligand, as suggested by Forrest et al., to thereby obtain desired emissive properties. Dedeian et al. recognize that facial iridium phenylpyridine complexes that are substituted with either one fluorine or one trifluoromethyl can be successfully prepared (see page 1686, paragraph bridging the first and second columns). Forrest et al. recognize that such modifications are within the skill level of the art (see column 17, line 44 to column 18, line 27).

Response to Arguments

4. Applicant's arguments with respect to claim 12 has been considered but is moot in view of the new ground of rejection.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Thompson et al. (US 6,830,828 B2) teach an iridium

phenylpyridine complex that may include substituents located in various positions of the ligand in order to desirably alter emissive properties.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen W. Smoot whose telephone number is 571-272-1698. The examiner can normally be reached on M-F (8:00 am to 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

sws

Stephen W. Smoot

STEPHEN W. SMOOT
PRIMARY EXAMINER